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Assessment of Left Ventricular Functions With Strain and Strain Rate Echocardiography in Children with Duchenne Muscular Dystrophy

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Introduction: Duchenne muscular dystrophy (DMD) is the most common hereditary neuromuscular disorder affecting individuals from all races and ethnic origins. Although the cardiac involvement may be subclinical, it may also present as cardiomyopathy (CMP) and heart failure. It has been reported that in spite of the preserved ejection fraction (EF) values in early stages of the disease; when the response to treatment is better, there might be actually occult systolic dysfunction

Methods: The aim of this study was to assess the myocardial functions of DMD patients using PW-DDI and S/SR echocardiography who had normal results in conventional echocardiography before, and to compare them with the results of the control group.

Results: In our study, 32 male patients with DMD whose mean age was 85.2 ± 38.4 months were compared with 31 healthy boys whose mean age was 89.0 ± 38.9 months. The EF and shortening fraction (SF) values of both DMD and control group subjects were within normal ranges. A statistically significant difference was found regarding the heart rate between the two groups ($p<0.001$). Patients with DMD were found to have higher heart rate. In the measurements performed from the base of the interventricular septum, statistically significant differences were found between the Em, S amplitude and isovolumetric relaxation time (IVRT), myocard performance index (MPI) values of the two groups ($p<0.05$). Besides, in the measurements made from the base of the left ventricular free wall, Em, S amplitude and IVRT, MPI values were shown to be significantly different ($p<0.05$). In addition, the results of the S and SR measurements done from the base of the left ventricular free wall were significantly different between patients and control group ($p<0.001$), and in the global strain measurement performed from the apical 4-chamber position, a significant difference was noted between the two groups ($p<0.001$).

Conclusion: We suggest that when evaluating left ventricular functions in these cases detection of the subclinical dysfunction using techniques like S/SR echocardiography apart from the conventional echocardiography would be useful for the timing of treatment and follow up of the patients.